A SHORT HISTORY OF OUR COOPERATIVE SYMPOSIUMS AT THE RESERCH INSTITUTE FOR MATHEMATICAL SCIENCES OF KYOTO UNIVERSITY(Theory of Dynamical Systems and Its Application to Nonlinear Problems)

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A SHORT HISTORY OF OUR COOPERATIVE SYMPOSIUMS AT THE RESEARCH INSTITUTE FOR MATHEMATICAL SCIENCES OF KYOTO UNIVERSITY

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It has elapsed about ten years since we started meeting for a symposium at the Research Institute for Mathemtical Sciences of Kyoto University in order to develop the interdisciplinary research on dynamical systems and its related fields. The first meeting was held from July 7 to July 12 of 1975 and its aim was the study of dynamical systems on electrical circuits. About 20 mathematicians and electrical engineers gathered together. I organized the meeting with Y. Ueda's cooperation. The following mathematicians gave a series of lectures surveying the recent development of the theory of differentiable dynamical systems: H. Imanishi, K. Shiraiwa, G. Ikegami, S. Ichiraku, T. Nishimori, T. Okabe, S. Matsumoto, M. Kurata, H. Matsue, T. Niwa, K. Yamato, and M. Goto.

T. Matsumoto and T. Ito gave lectures on a general theory of dynamical systems arising from electrical networks developed by R. Brayton, J. Moser, and S. Smale. Furthermore, T. Matsumoto presented his recent works and many interesting problems.

Y. Ueda, H. Kawakami, and N. Akamatsu gave many interesting results on the solutions of Duffing's Equation by means of analogue and digital computers. Many pictures of phase portraits, bifurcation diagrams, and invariant sets of the Poincaré mappings which are now called strange attractors were shown, and its relation to the theory of

differentiable dynamical systems were discussed. The proceedings of the symposium was published as the Kokyuroku No. 254(1975) of the Research Institute for Mathematical Sciences of Kyoto University in Japanese.

The meeting was so fruitful that we decided to continue the project. The second and the third meetings were held from July 5 to July 8 of 1976 and from July 6 to July 9 of 1977 respectively on the same theme. The organizer of the both meetings was Y. Ueda in cooperation with me from mathematical point of view.

At the second meeting, S. Ichiraku, a mathematician, presented a paper answering a problem posed by T. Matsumoto at the first meeting. This is the first concrete work based on our project. Since then, many cooperative researches were performed by mathematicians, scientists of the other fields, and engineers.

New contributors were as follows: (the second meeting) Y. Akamatsu, T. Koike, T. Otsuki; (the third meeting) T. Tsuboi, T. Matsumura, K. Yano, A. Morimoto. The proceedings of the second and the third meetings are the Kokyuroku No. 284(1976) and No. 313(1977) respectively.

We took rest in 1978 and took a further step in 1979, i.e. we hold the fourth meeting from July 11 to July 14 of 1979 on an extended theme. The following topics were included: Difference Equations Arising From Economics by F. Nakajima, Oscillators of Many Degrees of Freedom by M. Kuramitsu, Chaotic Behaviors in the Belousov-Zhabotinsky Reactions by K. Tomita and I. Tsuda, and Chaos in Lorenz Equations by S. Ushiki. Other new contributors were K. Sasano, N. Kakiuchi, A. Sannami, A. Koriyama, and H. Matsuoka. The proceeding is the Kokyuroku No. 370 (1979).

The fifth meeting was held from July 14 to July 17 of 1980 and its theme was "Chaotic Phenomena in Deterministic Systems and Dynamical System Theory". The organizer of the fourth and fifth meetings was Y. Ueda cooperated with me. New contributors were F. Takase, I. Ishii, S. Oishi, Y. Okumura, T. Ushio, K. Hirai, M. Iwai, T. Kohda, M. Dateyama, T. Nagase, and N. Aoki. The Kokyuroku No. 413(1981) is the proceeding of the fifth meeting.

The sixth and the seventh meetings were held from July 8 to July 11 of 1981 and from July 7 to July 10 of 1982 respectively on the fully extended theme. Both meetings were organized by G. Ikegami in cooperation with Y. Ueda. Proceedings are the Kokyuroku No. 443(1981) and No. 466(1982) respectively. From 80 to 90 researchers gathered together for each of these symposiums from various fields such as mathematics, physics, chemistry, biology, earth science, electric engineering, computer science, control theory, and other sciences and engineerings.

The new contributors were as follows: (the sixth meeting) G. Seifert, H. Ogura, H. Yoshida, K. Murao, K. Hiraide, T. Toyoda, H. Daido, T. Shimada, Y. Katsuta, J. Matsuo, R. Kuwabara; (the seventh meeting) Y. Kuramoto, S. Koga, M. Kitano, T. Yabusaki, T. Ogawa, K. Maginu, S. Sato, K. Naka, E. Hida, R. Ito, H. Ito, K. Sawada, M. Nakada.

The eighth meeting was held from July 6 to July 9 of 1983 on the theme "Nonlinear Phenomena and Dynamical Systems". The organizer was H. Kawakami in cooperation with me. The proceedings is the Kokyuroku No. 506(1983). The new contributors were as follows: M. Komuro, T. Kohyama, Y. Aizawa, Y. Togawa, N. Saitô, M. Yamaguti, M. Hata, J. Kigami, M. Matsubara, H. Kokubu, H. Oka, N. Yamamoto.

The ninth meeting is also organized by H. Kawakami in cooperation with me, and this is the proceedings of this symposium.

Now it becomes obvious that our project is successful. We are very grateful to the Research Institute for Mathematical Sciences for giving us an opportunity of holding such fruitful symposiums. We feel that mathematicians, scientists, and engineers should cooperate in the research of dynamical systems. Such cooperations are mutually advantageous for mathematicians, other scientists, and engineers. I hope that such cooperations are everlasting and fruitful for the advancement of sciences and engineerings.